

2.13 Rotavirus

Etiology

Rotavirus is a genus of double-stranded RNA virus in the family *Reoviridae*. There are five species of this virus, referred to as A, B, C, D, and E. *Rotavirus A*, the most common species, causes more than 90% of infections in humans.

Case Definitions

Confirmed Case

Clinical illness with laboratory confirmation of infection:

Identification of virus in stool by electron microscopy, ELISA, latex agglutination or molecular methods when available.

Probable Case

Clinical illness in a person who is epidemiologically linked to a confirmed case.

Clinical Presentation

Rotavirus infection is primarily characterized by fever, vomiting, and watery, non-bloody diarrhea. This large loss of water can lead to severe dehydration, electrolyte imbalance, and potentially death.

Diagnosis

Demonstration of rotavirus antigen in stool specimens. For confirmation on laboratory specimens go to the public health laboratory web site www.publichealthlab.ca or call 709-777-6583.

Epidemiology

Occurrence

Rotavirus causes one-third of gastroenteritis-related hospitalizations in children throughout the world, with a greater prevalence in developing countries. Virtually all children are infected with rotavirus before the age of three. The global child mortality rate due to rotavirus infection is between 600,000 and 870,000 deaths per year. The Canadian Immunization Monitoring Program, Active (IMPACT) recorded 1359 hospitalizations in children between January 2005 and December 2007 due to rotavirus infection. These hospitalizations were solely recorded in 12 hospitals taking part in IMPACT. The mean age of hospitalization was 2.4 years. Between 2006 and 2010 in Newfoundland and Labrador, there has been an average of 35.4 cases per year. There is a large variety in the number of cases of rotavirus that appear from year-to-year in this province. 145 cases were noted in 1999 while seven (7) were reported in 2010. In this province, rotavirus operates in a seasonal pattern with greater prevalence of cases during the winter months.

Reservoir

The reservoir is most likely humans. Group A, B, and C rotavirus species have been found to infect both humans and animals, but no interspecies transmission has been noted. It is important to remain vigilant of the possibility of this means of transmission.

Transmission

The most common mode of transmission of rotavirus is the fecal-oral route. Rotavirus can also be transmitted through contaminated water. It is also believed that rotavirus can be spread through respiratory contact.

Incubation Period

The incubation period is between one to three days.

Communicability

Rotavirus shedding rate is the highest during the diarrheal stage of the disease, which occurs during the first two to five days of illness. It is not generally detectable eight (8) days after onset of illness, but viral shedding has been known to occur up to thirty (30) days after onset of illness in immunocompromised patients.

Control Measures**Management of Case*****Investigations***

- Obtain a food history when foodborne transmission is suspected,
 - Identify recent ingestion of potentially contaminated food (especially poultry, beef, and pork) or water, or unpasteurized milk and the time of consumption.
- Determine the possible source of infection taking into consideration the incubation period, reservoir, and mode of transmission.
- Assessing for possible cross contamination (e.g. cutting boards).
- Determine occupational exposure (e.g., animal or meat handling).
- Identify history of recent travel especially to areas with inadequate sanitation, water and sewage treatment.
- Assess for history of residing in areas with poor sanitation including improper water treatment and sewage disposal and include recent immigration.
- Identify recent illness in pets or acquisition of a puppy or kitten into the household.
- Assess for history of similar symptoms in other members of the household.
- Suspected contaminated food may be held to prevent of consumption.
- Suspected contaminated food may be destroyed.
- Contact precautions should be used for hospitalized children and for hospitalized adults who have poor hygiene or incontinence.
- Rotavirus vaccine was introduced for all children born in July 2015 and is administered at two and four months of age.

Treatment

In most cases of rotavirus infection, oral rehydration therapy with oral glucose-electrolyte solution is a sufficient method of treatment. Zinc may be given to children less than five years of age. Cases may need to be kept in isolation.

Exclusion

Exclusion (staying away from school or work) is recommended for symptomatic individuals who work handling food, or who work with infants, the elderly, the immunocompromised and with institutionalized patients or residents. Advise work restrictions until the case has been symptom free for 48 hours.

Management of Contacts

Contact investigation should be initiated and a search for the source of infection in high-risk populations. Furthermore, caretakers of children with rotavirus infection need to adopt strict hygienic control measures for their own protection against rotavirus.

Management of Outbreaks

An outbreak management team should be established to direct and coordinate the investigation as well as address infection prevention and control measures. If the outbreak is limited to one region the region is responsible to manage the outbreak; if more than one region is involved the outbreak will be managed by the province or in consultation with the province.

Education and Preventive Measures

The following are several steps that can be taken to prevent acquisition of rotavirus:

- Rotavirus vaccination is part of the routine childhood immunization schedule in Newfoundland and Labrador.
- Water chlorination can inactivate rotavirus.
- Ensure that children wear overalls over diapers in daycare settings.
- Oral administration of immunoglobulin has been shown to be effective in protecting immunocompromised neonates and neonates with low birth weights.
- Strict adherence to hygiene protocols.
- More information available at <http://www.phac-aspc.gc.ca/lab-bio/res/psds-ftss/rotavirus-eng.php>

Reporting Requirements and Procedures

- The laboratory (hospital or public health laboratories) report case/s to the attending physician, the Chief Medical Officer of Health and the Medical Officers of Health (MOH)
- The MOH office will notify, as required, local physicians, nurse practitioners, environmental health officers, community health nurses, communicable disease control nurses (CDCNs) and infection control practitioners (ICP), in the particular region as required for follow-up and case investigation.

- EHO will conduct an investigation of the case under the direction of the MOH and provide case details as per the food history.
- CDCN enters the case details into the electronic reporting system and uses the CNPHI tool, if indicated, for alerts or outbreak summaries

Provincial Disease Control

- Reports the aggregate case data to Public Health Agency of Canada
- Provides an analysis of the case/s with reports in the Quarterly Communicable Disease Report (CDR), also posted on the Public Health website
- Coordinates the response if an outbreak across RHAs (CMOH will likely coordinate an outbreak across RHAs with input from disease control and environmental health.)

References

Public Health Agency of Canada. Human Rotavirus. Retrieved June 9th, 2013, from <http://www.phac-aspc.gc.ca/lab-bio/res/psds-ftss/rotavirus-eng.php>